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ABSTRACT

In response to Maccoby and Jacklin's (1974) conclusion that sex differences in aggression must be biological in origin, we suggest alternative social-learning mechanisms to explain the differences. These mechanisms include: (1) punishment for aggression increases aggression in boys, particularly because boys do not identify with the punisher; (2) boys receive sensitization training, while girls receive induction training; (3) boys receive more rewards for aggression; and (4) girls receive verbal sex-role training that discourages aggression while boys receive verbal sex-role training that encourages it. These hypotheses were tested with observations of 1,147 aggressive acts of 157 children in nine preschool and kindergarten classrooms. All of the hypotheses received support except the induction hypothesis and the verbal sex-role training hypothesis. (Author)

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The Development of Sex Differences in Aggression:
A Revised Model

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Abstract

In response to Maccoby and Jacklin's (1974) conclusion that sex differences in aggression must be biological in origin, we suggest alternative social-learning mechanisms to explain the differences. These mechanisms include: (1) punishment for aggression increases aggression in boys, particularly because boys do not identify with the punisher; (2) boys receive sensitization training, while girls receive induction training; (3) boys receive more rewards for aggression; and (4) girls receive verbal sex-role training that discourages aggression while boys receive verbal sex-role training that encourages it. These hypotheses were tested with observations of 1,147 aggressive acts of 157 children in 9 preschool and kindergarten classrooms. All of the hypotheses received support except for the induction hypothesis and the verbal sex-role training hypothesis.

The Development of Sex Differences in Aggression:

A Revised Model

In their important review, Maccoby and Jacklin (1974) concluded that the social-learning model fails to explain sex differences in aggression so that these differences must be biological in origin. The present paper explores alternative social-learning mechanisms to explain the differences and presents data relevant to these hypothesized mechanisms.

Maccoby and Jacklin assumed that punishment for aggression should lead to a decrease in aggressive behavior. However, the work of Eron et al. (1963, 1974) and others suggests that punishment may actually lead to increased aggression. Hence if boys are punished more for aggression, this may contribute to their greater aggression.

Aronfreed (1961) categorized parents' disciplinary techniques into sensitization and induction. Induction training, such as explaining to the child what kinds of behavior are unacceptable, leads the child to internalize standards of behavior. Sensitization training, such as physical punishment or yelling, leads the child to expect pain as a consequence of aggression and to depend on external forces to control her/his behavior. If boys tend to receive sensitization responses to their aggression and girls tend to receive induction responses, this would also help to explain the lower aggression of girls and the higher aggression of boys.

Eron et al. (1974) have found that one of the most powerful predictors of children's aggression is identification with the

punisher. If the child is highly identified with the punisher, punishment will reduce aggression, but if the child does not identify with the punisher, punishment leads to increased aggression. The major disciplinarians of young children are typically the mother (a female) and the teacher (usually also a female). If children do identify more with adults of the same sex than with adults of the opposite sex, girls would be more highly identified with the punisher than boys, and punishment would decrease aggression in girls and increase aggression in boys.

Patterson et al. (1967) have argued that children's aggressive behavior is also shaped by direct positive reinforcements. These rewards come not only from adults, but also from child-victims. If boys are rewarded more, both by adults and peers, for aggression, this would help to explain their greater aggression.

Following a cognitive-developmental model, children may receive cognitive sex-role training about aggressive behavior, which would discourage aggression in girls and encourage it in boys. Examples would be verbal comments from adults like "Boys will be boys" and "Nice young ladies don't do things like that" in response to children's aggression.

Data relevant to these hypothesized mechanisms were obtained from observations of children and their teachers in nursery school and kindergarten classes.

STUDY I

Method

Subjects. The subjects were 157 children (79 males, 78 females) in 9 nursery school and kindergarten classes in 6 schools in the

midwest. They ranged in age from 2 years 2 months to 6 years 3 months, with a mean age of 4 years 9 months.

Experimenters. The observers were 16 undergraduates (12 females, 4 males) who were trained to use the coding system. They were unaware of the exact purpose of the study and the investigators' hypotheses.

Procedure. The children were observed in their classrooms, as well as on the playground if the class moved outside, in 20-min observation periods. The observers attempted to be as unobtrusive as possible. In order to improve the reliability of observations, observers worked in pairs, observing the same class, and pooled their observations to form a data sheet.

For each aggressive act that was observed, the following information was recorded: (1) sex of aggressor; (2) aggressor's behavior (physical attack to a person, physical attack to an object, verbal attack, symbolic aggression, and infringing on another's property such as taking a toy); (3) the object of aggression (teacher, female child, male child, object); (4) teacher's response (physical punishment, loud verbal punishment, soft verbal response, sex-role training, withdrawal of affection, ignore, attention, does not see the act); (5) the child/victim's response (retaliates, recovers property, tells teacher, passive, defensive, cries); and (6) the aggressor's response (same as (2) plus discontinues). The coding categories for (2) and (5) were based on those used by Patterson et al. (1967).

A total of 1, 149 aggressive acts were observed and coded.

Estimates of reliability were obtained using 2 pairs of observers watching the same class. Interrater agreement was high on the coding categories: 98% agreement for aggressor's

behavior, 100% for object of aggression; 70% for adult response; 72% for child response; and 86% for aggressor's response.

Results and Discussion

Statistical analysis using the classroom as the unit of analysis indicated that boys committed significantly more aggressive acts than girls did, $t = 5.10$, $df = 8$, $p < .0001$. This pattern obtained consistently in every classroom. Boys committed about twice as many acts of physical aggression as girls did, and the difference was statistically significant, $t = 4.43$, $df = 8$, $p < .0001$. The sex difference in the number of acts of verbal aggression, however, was not statistically significant, $t = 1.28$, $df = 8$.

Boys received about 3 times as many sensitization responses from teachers as girls did, a difference that was statistically significant, $t = 1.95$, $df = 8$, $p < .05$. However, after the data were corrected for the differences in the number of aggressive acts committed by boys and girls respectively, this sex difference in sensitization was no longer statistically significant. That is, proportionately boys are no more likely to receive sensitization training; it appears that they receive more only because they commit more aggressive acts.

Boys received about 3 times as many induction responses as girls did, a difference that was statistically significant, $t = 2.13$, $df = 8$, $p < .05$. However, after correcting for sex differences in the base rate of aggression, this difference was no longer significant.

Following Patterson's definition of "reward," boys were rewarded for aggression^{by adults} significantly more than girls were, $t = 3.76$, $df = 8$, $p < .0005$. However, after correcting for sex

differences in the base rate of aggression, girls were rewarded significantly more. Males were rewarded more by their child-victims, although this difference disappeared after correcting for sex differences in the base rate of aggression.

Males were punished for aggression by the teacher about 3 times as frequently as girls were, a difference that was statistically significant; once again, though, this difference was not significant after correcting for sex differences in the base rate of aggression.

Males were considerably more likely to persist at aggression, and this difference was statistically significant even after correction for sex differences in the base rate of aggression.

It was impossible to test the hypothesis about verbal sex-role training, since only one such comment from a teacher was observed. The comment was, in response to a little girl's aggression, "Sherry, are you a boy?"

STUDY II

This study was designed to obtain data on whether girls really identify more with their female teacher than boys do. The subjects were 57 children (32 boys and 25 girls) in 3 kindergarten classes. They ranged in age from 4 years 6 months to 6 years 0 months ($\bar{X}$ = 4 years 11 months). Each child was tested individually by a female experimenter.

Two measures of identification were administered. One was a modification of Hartup's (1962) technique, questioning the child in a play situation with 2 dolls representing an adult male and adult female teacher and a third doll, the same sex as the child, representing the child. The other measure was a

modification of Bloomer's (1964) technique. The child is asked some fairly explicit identification questions such as "Would you like to grow up to be like Mrs. (teacher's name) or would you rather grow up to be like someone else?"

A 2 (sex) x 3 (classrooms) analysis of variance indicated that girls had a significantly higher identification with female teachers, for both measures. Classroom and sex x classroom effects were not statistically significant.

CONCLUSION

The following hypotheses were supported by the data:

- (1) Boys receive more sensitization training from their teachers than girls do, but proportionately there is no difference.
- (2) Adults reward boys more for aggression, but proportionately girls are rewarded more. Child victims reward boys more, but proportionately there is no set difference. Adults also punish boys more for aggression than they do girls, but proportionately there is no difference.
- (3) Boys are more likely to persist in aggressive behavior, suggesting that the reinforcement contingencies following boys' aggression do little to make them stop.
- (4) Girls identify more with their female teachers, who discipline them, than boys do.

The induction and sex-role-training hypotheses received no support, the latter because only one such incident was observed.

One issue requires further discussion. In testing many of the hypotheses, we conducted two statistical analyses, one based on the absolute number of acts of aggression, the other looking

at the number of acts proportionate to the number committed by boys and the number committed by girls. The former gives a measure of the absolute number of times that boys or girls receive, for example, sensitization training. The latter provides probability statements--for example, given an aggressive act by a boy and one by a girl, is the boy more likely to receive a sensitization response? Often, however, there was a conflict between the results of the two analyses. For example, in absolute terms boys received more sensitization training, but proportionately there was no difference. Given the conflicting results, what should we conclude? It seems that both are relevant, particularly when taken together. We might conclude, for example, that boys receive more sensitization training, and this helps to explain their greater aggressiveness; but they receive more sensitization training not because adults have different standards in reacting to them (the probabilities of boys receiving sensitization and girls receiving sensitization are about equal), but rather because boys emit so many more acts of aggression.

The results, then, seem to be compatible with a biology-environment interaction model of sex differences in aggression. If the sexes start with a slight, biologically-produced difference in aggression, cultural contingencies then act to magnify it. For example, boys in early childhood may be only slightly more aggressive than girls, but this makes them more likely to receive sensitization training and rewards, which makes them more likely to commit more aggressive acts, which produce more sensitization and rewards, and so the cycle goes until boys are considerably more aggressive than girls are.

The one mechanism we postulated and found evidence for, that does not require this initial assumption of some slight biological differences, is identification. Simply because of our social structure, young boys and girls receive most of their early discipline from women (mothers and female teachers). Since girls identify more with them, punishments decrease their aggression, while for boys, who identify less with the punisher, the discipline increases their aggressiveness. This mechanism could thus produce sex differences in aggression even if boys and girls have similar biologically-produced levels of aggression.

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